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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/534,001	04/04/2006	Robin Provost	15818-26US AD/mb	1373
20/988 7590 03/20/2009 OGILVY RENAULT LLP 1981 MCGILL COLLEGE AVENUE SUITE 1600 MONTREAL, QC H3A2Y3 CANADA				
EXAMINER				
RAO, SHEELA S				
ART UNIT		PAPER NUMBER		
2123				
MAIL DATE		DELIVERY MODE		
03/20/2009		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/534,001

Applicant(s)

PROVOST ET AL.

Examiner

Sheela Rao

Art Unit

2123

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 May 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-41 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-41 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 May 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-8508)
Paper No(s)/Mail Date 5/5/05
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

1. This Office action is in response to papers filed on 5 May 2005.
2. Claims 1-41 are pending and presented for examination.
3. Applicant's submission of references on form PTO-1449, filed on May 5, 2005, has been considered. A signed copy of the form is attached.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 7, 24 and 38 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In line 3, of each of the claims, "an element" is cited. This recitation of "an element" gives reason for indefiniteness as it is not clear whether the element is meant to be the item being modeled or the editing function or one of the different designing tools. Appropriate correction required.

Claim Rejections - 35 USC § 101

6. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

7. Claims 34-41 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claim 34 defines a "computer signal embodied in a carrier wave" with descriptive material. While "functional descriptive material" may be claimed as a statutory product (i.e. "manufacture") when embodied on a tangible computer readable medium, a signal, carrier wave, etc. embodying that same functional descriptive material is neither a process nor a product (i.e., a tangible element) and therefore does not fall within one of the four statutory classes of 35 USC §101. Rather, "signal" is a form of energy, in the absence of any physical structure or tangible material.

Claim 35 is directed to a system for designing a dental prosthesis with the system comprising modules that involve different actions to be taken in the design of the dental prosthesis. However, it appears that the system can reasonably be interpreted by one of ordinary skill in the art as software per se, because the elements included in the system are just software components (i.e. *data store module, designing module, and an output module*). This subject matter is not limited to that which falls within a statutory category of invention because it is not limited to a process, a machine, manufacture, or a composition of matter. Claims 36-41 fail to resolve the deficiencies of claim 35 and are thus also rejected.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

9. Claims 1, 16 and 34 are rejected under 35 U.S.C. 102(e) as being anticipated by US Patent No. US 6,915,178 B2 to O'Brien et al.

The reference of prior art to O'Brien et al. (hereinafter "O'Brien") discloses the making of a dental prosthesis by forming a model and then creating three-dimensional data corresponding to the surfaces of the model. The patented invention anticipates the limitations of the instant invention as explained herewith.

With regard to claims 1 and 16, wherein the method is claimed, the steps of designing a dental prosthesis includes a plurality of components of the dental prosthesis to be designed, with each one of the plurality of components having a distinct function (see col. 3:ll. 54-58 – the making of a patient's dentition is stated); designing each of the plurality of components separately using virtual tools to produce virtual designs and generating separate data sets, while maintaining a relative reference among said components in a common reference frame (see col. 3:ll. 66 - col. 4:ll. 1 – the use of computer aided design (CAD) equipment is taught); and producing a dental prosthesis model data set representing said dental prosthesis a dental prosthesis model data set representing the dental prosthesis using all of the separate data sets (see col. 4:ll. 33-40 – where the production of dentition model data is discussed) are presented. In addition to the aforementioned limitations, claim 16 also includes the step of acquiring

three-dimensional digital data relating to a patient's dentition (taught in column 4 at lines 20-22 as collecting and storing the data of the model of a patient's dentition as three-dimensional data) and producing the dental prosthesis using the dental prosthesis model data set (as stated in the abstract of the patented invention, the three-dimensional data of the dental prosthesis to be manufactured is transmitted so as to make the dental prosthesis).

Claim 34 defines a software product, as best interpreted, for the designing methodology of a dental prosthesis. The system for designing a dental prosthesis includes identifying a plurality of components of the dental prosthesis to be designed having a distinct function (see col. 3:ll. 54-58 – the making of a patient's dentition is stated); designing each of the plurality of components separately using virtual tools to produce virtual designs and generating separate data sets, while maintaining a relative reference among said components in a common reference frame (see col. 3:ll. 66 - col. 4:ll. 1 – the use of computer aided design (CAD) equipment is taught); and producing a dental prosthesis model data set representing said dental prosthesis a dental prosthesis model data set representing the dental prosthesis using all of the separate data sets (see col. 4:ll. 33-40 – where the production of dentition model data is discussed) are presented by O'Brien. The use of computer software to achieve the methodology with the system claimed is an essential and inherent to a system as disclosed by O'Brien.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 2, 6, 8-11, 17, 21 and 25-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No. US 6,915,178 B2 to O'Brien et al. in view of US Patent No. US 6,835,066 B2 to Iiyama et al.

The limitations of the independent claims, claims 1 and 16, are stated above as being anticipated by O'Brien.

As per claims 2 and 17, the step of designing each of the plurality of components separately comprises selecting and using a different designing tool for each one of the plurality of components such that different editing functions in each of the different designing tools are used when designing the components is claimed. Although the patented invention of O'Brien teaches the designing of a dental prosthesis, the use of different designing tools for different editing functions is not particularly suggested. However, the reference of Iiyama teaches the use of a CAD/CAM system which includes a plurality of tools and editing functions so as to be able to produce a well fitted dental prosthesis within the oral cavity of a patient in column 3 lines 11 et seq. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have included the CAD/CAM system as taught by Iiyama with the designing methodology of O'Brien in order to achieve a more effective and usable dental prosthesis.

Claims 6 and 21 are directed to producing a dental prosthesis model data set that comprises collecting together each of the separate data sets for transmission to a

manufacturing tool. Even though O'Brien teaches the production of a dental prosthesis, the prior art fails to specifically teach the transmission of data to a manufacturing tool. Yet, the invention by Iiyama addresses this feature of the instant invention beginning at line 5 in column 4 where the measured data is sent to a design center using communication means and at the design center, dental laboratories are included wherein the device can be manufactured. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have included means for transmitting data so as to produce a dental prosthesis using a manufacturing tool as it is for this reason that the data is collected.

With regard to claims 8-10 and 25-27, the editing functions of the different designing tools is defined as being an adjustment of width, length, and height parameters (claims 8 & 25) taught by Iiyama in column 5 at lines 37-40; being one of scaling (claims 9 & 26) taught by O'Brien in column 4 at lines 33-35 as manipulating the surface; and as a surface adjustment (claims 10 & 27) taught by Iiyama in column 4, lines 15-38.

In claims 11 and 28 the surface adjustment is defined as using virtual handles placed on a surface at specific locations and used to deform the surface at the specific locations. O'Brien teaches this aspect of the instant invention in column 4, lines 44-47, where the use of a mouse, keyboard, etc. allow the use of virtual handles to adjust or deform the surface.

12. Claims 7 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No. US 6,915,178 B2 to O'Brien et al. in view of US Patent No. US 6,835,066

B2 to Iiyama et al. as applied to claims 2 and 16 above, and further in view of US Patent No. 6,049,743 to Baba.

Claims 7 and 24 further define the editing functions of the different designing tools as a selection of an element from a predetermined set of elements. Although the combination of O'Brien and Iiyama teach the designing of dental prosthesis using CAD systems, they fail to teach the selection of an element from a predetermined set of elements as per the instant claims. However, the prior art of Baba teaches the use of morphology definition data to include data that defines a plurality of deforming, i.e. editing, regions as described in column 8 in lines 7-33. The morphology data, i.e. by definition data that includes structure and form, is used to conform the data to individual teeth. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have included the morphology data as in Baba for selecting an element from a set of predetermined elements for editing purposes with the designing methodology of O'Brien and Iiyama so as to enable a more accurate configuration of the dental prosthesis.

13. Claims 3-5, 12-15, 18-20, 22-23, 29-33 and 35-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No. US 6,915,178 B2 to O'Brien et al. in view of US Patent No. 6,049,743 to Baba.

The limitations of the independent claims, claims 1 and 16, are stated above as being anticipated by O'Brien.

Claims 3 and 18 define the producing dental prosthesis model data set as comprising integrating separate data sets into a single three-dimensional virtual model.

O'Brien fails to teach this feature of the instant claims; however, the prior art of Baba discloses this in column 7 at lines 47-50, wherein the pontic model data set defining the configurations of individual teeth is stored in a database. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have stored data that includes information regarding the separate sets as one three-dimensional model as done by Baba in the designing process of O'Brien would be an obvious addition since a dental prosthesis is a collective representation of the individual teeth within ones oral cavity and storing data as such would enable easily accessibility to the configuration data.

As per claims 4 and 19, editing the three-dimensional virtual model once all the components have been integrated is claimed. Baba teaches this element of the instant claims in column 5, lines 50-57

Claims 5 and 20 are directed to the editing of the single three-dimensional model data set including editing one of the components without affecting a remainder of the plurality of components. The patented invention of Baba explains this beginning at line 59 of column 7.

With regard to claims 12 and 29, the designing at least one of the plurality of components comprises using information from a data set generated by at least another one of the plurality of components. As stated in column 7, at lines 54 onwards in the reference to Baba, the data of the model is stored as P_m , where m includes the data of each of the teeth as shown in Fig. 4, thereby constituting data being generated for a plurality of components.

As per claims 13 and 30 designing includes designing at least one of the plurality of components without regards to another one of the plurality of components having at least a portion of a common surface with one of the plurality of components, and wherein one of the plurality of components is designed to overlap another one of the components along a portion of a common surface is claimed. Baba explains this aspect of the instant invention in column 7 line 59 through column 8 line 6, where the position of each of the "components" is described.

Claims 14 and 31 claim the breaking down of one of the plurality of components into multiple elements and is taught by Baba at lines 39-55 of column 9 where the deforming operation is explained.

Claims 15 and 32 involve using multiple designing tools for a single one of the plurality of components. Baba teaches this aspect beginning at line 48 in column 10 with the CAD/drawing library with regard to the designing program.

As with claims 22 and 33, the producing of the prosthesis in one piece is claimed. This is taught by Baba in column 10 at lines 27-39 which teaches the bridge model and crown model.

Claim 23 defines sending the separate data sets to a manufacturing tool. In lines 16-20 of column 10, Baba alludes to the sending of data to the manufacturer.

Claim 35 is directed to a system for designing a dental prosthesis, with the system comprising a data store module for storing separately a plurality of components of the dental prosthesis to be designed, wherein a relative reference is maintained among the plurality of components in a common reference frame (see item 3-internal memory in Fig. 2 and col. 7:ll. 46-57) while the common reference frame is equated to

the patient's mouth as the designed elements must fit into this area; a designing module for designing each of the plurality of components separately using virtual designs of the plurality of components and generating separate data sets (see items 4 & 5-dental prosthesis model designing components in Fig. 2 and col. 6:ll. 45-57 and 59 et seq.); and an output model for associating each of the separate data sets together and outputting the separate data sets together to a manufacturing device (see item 7-display and printer device in Fig. 2 and col. 6:ll. 54-55). The prior art of O'Brien teaches of the individual elements of independent claim 35 as mapped out above in reference to claim 1, as the limitations are parallel in nature. However, the prior art of O'Brien fails to specifically teach the use of a computer program to control or run each of the modules on the CAD system; however, the prior art of Baba specifically teaches the use of a computer program product that is used for executing the components of the CAD system as explained in column 6, beginning at line 59 the dental prosthesis dental program detail. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used the computer program for designing a dental prosthesis model as done by Baba in the methodology of O'Brien since it is well known that software is used to control or run a CAD system. Furthermore, using a computerized methodology decreases the amount of labor required and achieves a more efficient design of the dental prosthesis as noted by Baba in column 1 at lines 40-41.

Claim 36 defines the designing module as comprising a plurality of designing tools such that at least one of the plurality of components is modeled with a different designing tool than a remainder of the components. Baba teaches this aspect

beginning at line 48 in column 10 with the CAD/drawing library with regard to the designing program.

Claim 37 is directed to the output model including a tool for combining the separate data sets mathematically and producing a single three-dimensional virtual prosthesis model. This is done by Baba as taught in column 8, lines 49-63.

Claim 38 requires the different designing tools to comprise a selector for selecting an element from a predefined set of elements and is taught by Baba at lines 7-33 of column 8.

14. Claims 39 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No. US 6,915,178 B2 to O'Brien et al. in view of US Patent No. 6,049,743 to Baba as applied to claims 1 and 35 above, and further in view of US Patent No. US 6,835,066 B2 to Iiyama.

The limitations of independent claim 35 as taught by Baba are aforementioned.

Claim 39 further defines the designing tools as comprising a cursor to adjust width, length, and height parameters; while claim 41 includes a surface adjustment marker. Even though Baba teaches the use of a CAD system for the designing of a dental prosthesis, the specific use of a cursor or surface adjustment marker is not taught. The prior art of Iiyama also uses a CAD system for the design of dental prosthesis, but Iiyama particularly teaches the use of graphic display devices in the designing phase of the prosthesis. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have included such design tools as used

by Iiyama in the system/method of Baba so as to enable a more accurate and user-friendly design tool/system.

15. Claim 40 is rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No. 6,049,743 to Baba in view of US Patent No. US 6,915,178 B2 to O'Brien et al.

The limitations of independent claim 35 as taught by Baba are aforementioned.

Claim 40 includes a scaling tool as one of the different designing tools in the system for designing dental prosthesis. The patented invention of Baba does not specifically state the use of a scaling tool among the used designing tools. However, the prior art of O'Brien teaches the use of manipulating the surface of the dentition in column 4, lines 33-47. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have included a scaling or surface manipulating tool as in O'Brien to the system/method of Baba so as to be able to prepare the surfaces of the dental prosthesis for manufacturing and use.

Conclusion

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sheela Rao whose telephone number is (571) 272-3751. The examiner can normally be reached Monday - Wednesday from 9:00 am to 3:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Rodriguez, can be reached on (571) 272-3753. The fax number for the

organization where this application or any proceeding papers has been assigned is (571) 273- 8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. It should be noted that status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see [http:// pair-direct.uspto.gov](http://pair-direct.uspto.gov). Should any questions arise regarding access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Sheela Rao/
Examiner, Art Unit 2123
March 11, 2009

/Paul L Rodriguez/

Supervisory Patent Examiner, Art Unit 2123